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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,698	08/08/2001	Toshihiro Yanagi	70904-56376	2439
21874	7590	11/04/2004	EXAMINER	
EDWARDS & ANGELL, LLP P.O. BOX 55874 BOSTON, MA 02205			LIU, MING HUN	
			ART UNIT	PAPER NUMBER
			2675	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/924,698

Applicant(s)

YANAGI ET AL.

Examiner

Ming-Hun Liu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,052,103 to Fujiwara et al in view of US Patent 5,734,291 to Tasdighi et al.

In reference to claim 1, Fujiwara teaches an active matrix display device that resembles the hold and scanning pattern suggested by the applicant. Fujiwara's invention can best be understood by referring to figure 5 and the description of the figure in column 7, lines 62-65. The figure shows the scan of the display in two distinct modes, a scanning mode (Tw) and a hold mode (Th), where the hold mode is clearly longer than the scanning mode. Every pixel experiences both scan and hold modes.

Fujiwara however, does not go into specifics of the display power supply. As one skilled in the art understands, portable devices often use charge pumps to achieve different DC/DC voltages. Tasdighi explains in his patent that charge pumps, when switching between high and low power consumption modes, can achieve further power conservation by altering the frequency in which the pumps are driven. More specifically, low power consumption mode is accomplished by reducing the operating frequency of the charge pump (column 1, line 49-50), reducing the output frequency of the oscillator to 1/100 of the normal operating frequency or any other suitable value (column 5, lines 4 - 13).

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As demonstrated by both Fujiwara's and Tasdighi's references, the components necessary to construct the applicant's invention have already been known in the art. Fujiwara's invention could be modified according to resembled the claimed invention by using Tasdighi's charge pump system as the power supply. Charge pump power supplies are commonly used in portable display device technologies. It would have been obvious to one skilled in the art to combine both methods into the display art, as both methods are conventional, self-sufficient, power saving schemes used by engineers.

In reference to claim 2, the specifics of the charge pump are described in the Tasdighi reference. Tasdighi explains in column 5, lines 1-4 that charge pumps, to conserve power, are driven at lower frequencies and thus produce less current to the load. Tasdighi states on lines 4-13, to reduce the "output frequency to 1/100... other ratios are also suitable, depending on the expected load during the lower power mode. The low power frequency and the normal operating frequency should be set depending on the particular application." Tasdighi teaches that the specifics of the operational frequency and currents are to be determined according to the load of the device. Lastly on column 7, lines 20-25, Tasdighi teaches the ranges of possible operating current levels.

In reference to claim 3, Tasdighi teaches the use of an oscillator (figure 1, OSC-item 14) that generates a first clock signal used as a reference in the pump operation of the power supply in scanning mode (column 4, lines 56-62).

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In reference to claim 4, Tasdighi continues to describe in column 4, line 56- column 5, line 5, that the oscillating frequency is modified by a ratio in line 74 by units 16 or 18.

In reference to claims 5 and 6, figure 6 of Tasdighi shows a different embodiment where two different oscillating circuits are used to produce the desired frequencies controlled by switch 76.

In reference to claim 7, from figure 5 it can be seen that the scan and hold mode processes are repeated periodically.

In reference to claim 8, it can be seen from figure 5 that the hold period is considerably longer than the scan period. The multiplication factor, as one skilled in the art understands, is determined in the design process to ensure no loss in display clarity.

In reference to claim 9, the limitation of having a definite power signal before entering each mode (scanning or hold) is obvious if not inherent to the display art. It would have been obvious to one skilled in the art to know to complete the change of power supply frequency (out of the transient stage), to prepare the signal for use.

In reference to claim 10, Fujiwara teaches on column 5, lines 45-48 that the mode requires less power consumption than the scanning mode.

In reference to claim 11, charge pumps can be configured in several different fashions. Tasdighi provides examples of a variety of possible charge pump circuits. The examples cited by Tasdighi do not include regulators, however one skilled in the art understands that regulators are common in charge pump circuits for the purpose of stabilizing a particular voltage signal. Nonetheless Tasdighi shows in figure 7, a

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rudimentary charge pump that includes a first power supply ( $V_{in}$ ) a second power supply (C1) where the control line controls the charge addition of the pump.

In reference to claim 12, Tasdighi provides examples of a variety of possible charge pump circuits. The examples cited by Tasdighi do not include regulators, however one skilled in the art understands that regulators are common in charge pump circuits for the purpose of stabilizing a particular voltage signal. In figure 4, Tasdighi describes a charge pump capable of inverted voltages (item 58).

Claim 13 is rejected on grounds similar to the rejection of claim 1. Tasdighi states in his disclosure that portable devices require power conservation, a feature that is well understood by ones skilled in the art.

Claim 14 is rejected on grounds similar to the rejection of claim 1. As for the new portion of the claim, it can be seen from figure 7 of Tasdighi that C2 is a smoothing capacitor.

Claim 15 is rejected on grounds discussed in the rejection of claim 7.

Claim 16 is rejected on grounds discussed in the rejection of claim 2. As one skilled in the art understand  $V = IR$  relation translates to a decrease in voltage output.

In reference to claims 17 and 20, the limitation of having a definite power signal before entering each mode (scanning or hold) is obvious if not inherent to the display art. It would have been obvious to one skilled in the art to know to complete the change of power supply frequency (out of the transient stage), to prepare the signal for use. As shown from figure 5 of Tasdighi, the transience of the voltage source can be minimized by early preparation of the signal.

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Claim 18 is rejected on grounds discussed in the rejection of claim 2.

Claim 19 is rejected on grounds discussed in the rejection of claim 8.

Claim 21 is rejected on grounds discussed in the rejection of claim 10.

Claim 22 is rejected on grounds discussed in the rejection of claim 11.

Claim 23 is rejected on grounds discussed in the rejection of claim 12.

Claim 24 is rejected on grounds discussed in the rejection of claims 13 and 14.

Claims 25-32, it can be seen from figure 5 that the scanning period is extended to include the holding period.

Claim 33 is rejected on the grounds presented in the rejection of claim 2, the added limitations of claim 33 not addressed in the rejection of claim 2 is discussed in Tasdighi column 4, lines 61-46 where he states that the oscillator circuit is contingent on the RC values selected.

### *Conclusion*

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 6,633,287 to Yatabe et al.

US Patent 5,859,632 to Ito

US Patent 5,986,649 to Yamazaki

US Patent 6,426,594 to Ito

US Patent 5,777,593 to Kondoh

US Patent 5,894,297 to Mizutome et al.

US Patent 4,915,477 to Ohta et al.

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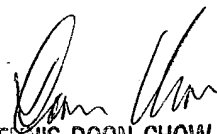
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ming-Hun Liu whose telephone number is 703-305-8488.

The examiner can normally be reached on Mon-Fri.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ming-Hun Liu

  
DENNIS-DOON CHOW  
PRIMARY EXAMINER